<110> Soto, Ana, et al.

<120> A NOVEL ANDROGEN-INDUCED SUPPRESSOR OF CELL PROLIFERATION AND USES THEREOF

<130> MBI-008-1

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<170> PatentIn Ver. 2.0

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Pro Pro Gly Val Lys Glu Ile Ser Asp Lys Ile Ser Lys Glu Glu Met
                 20                  25                  30

gtg aga cga tta aag atg gtt gtg aaa act ttt atg gat atg gac cag     206
Val Arg Arg Leu Lys Met Val Val Lys Thr Phe Met Asp Met Asp Gln
             35                  40                  45

gac tct gaa gaa gaa aag gag ctt tat tta aac cta gct tta cat ctt     254
Asp Ser Glu Glu Glu Lys Glu Leu Tyr Leu Asn Leu Ala Leu His Leu
         50                  55                  60

gct tca gat ttt ttt ctc aag cat cct ggt aaa gat gtt cgc tta ttg     302
Ala Ser Asp Phe Phe Leu Lys His Pro Gly Lys Asp Val Arg Leu Leu
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gta gcc tgc tgc ctt gct gat att ttc agg att tat gct cct gaa gct     350
Val Ala Cys Cys Leu Ala Asp Ile Phe Arg Ile Tyr Ala Pro Glu Ala
 80                  85                  90                  95

cct tac aca tcc cct gat aaa cta aag gat ata ttt atg ttt ata aca     398
Pro Tyr Thr Ser Pro Asp Lys Leu Lys Asp Ile Phe Met Phe Ile Thr
                 100                 105                 110

aga cag ttg aag ggg cta gag gat aca aag agc cca caa ttc aat agg     446
Arg Gln Leu Lys Gly Leu Glu Asp Thr Lys Ser Pro Gln Phe Asn Arg
             115                 120                 125

tat ttt tat tta ctt gag aac att gct tgg gtc aag tca tat aac ata     494
Tyr Phe Tyr Leu Leu Glu Asn Ile Ala Trp Val Lys Ser Tyr Asn Ile
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Cys Phe Glu Leu Glu Asp Ser Asn Glu Ile Phe Thr Gln Leu Tyr Arg
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acc tta ttt tca gtt ata aac aat ggc cac aat cag aaa gtc cat atg    590
Thr Leu Phe Ser Val Ile Asn Asn Gly His Asn Gln Lys Val His Met
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cac atg gta gac ctt atg agc tct att att tgt gaa ggt gat aca gtg    638
His Met Val Asp Leu Met Ser Ser Ile Ile Cys Glu Gly Asp Thr Val
                180                 185                 190

tct cag gag ctt ttg gat acg gtt tta gta aat ctg gta cct gct cat    686
Ser Gln Glu Leu Leu Asp Thr Val Leu Val Asn Leu Val Pro Ala His
                195                 200                 205

aag aat tta aac aag caa gca tat gat ttg gca aag gct tta ctg aag    734
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agg aca gct caa gct att gag cca tat att acc act ttt ttt aat cag    782
Arg Thr Ala Gln Ala Ile Glu Pro Tyr Ile Thr Thr Phe Phe Asn Gln
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gtt ctg atg ctt ggg aaa aca tct atc agc gat ttg tca gag cat gtc    830
Val Leu Met Leu Gly Lys Thr Ser Ile Ser Asp Leu Ser Glu His Val
240                 245                 250                 255

ttt gac tta att ttg gag ctc tac aat att gat agt cat ttg ctg ctc    878
Phe Asp Leu Ile Leu Glu Leu Tyr Asn Ile Asp Ser His Leu Leu Leu
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tct gtt tta ccc cag ctt gaa ttt aaa tta aag agc aat gat aat gag    926
Ser Val Leu Pro Gln Leu Glu Phe Lys Leu Lys Ser Asn Asp Asn Glu
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Glu Arg Leu Gln Val Val Lys Leu Leu Ala Lys Met Phe Gly Ala Lys
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gat tca gaa ttg gct tct caa aac aag cca ctt tgg cag tgc tac ttg    1022
Asp Ser Glu Leu Ala Ser Gln Asn Lys Pro Leu Trp Gln Cys Tyr Leu
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ggc agg ttt aat gat atc cat gta cca atc cgc ctg gaa tgt gtg aaa    1070
Gly Arg Phe Asn Asp Ile His Val Pro Ile Arg Leu Glu Cys Val Lys
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ttt gct agc cat tgt ctc atg aac cat cct gat tta gca aaa gac tta    1118
Phe Ala Ser His Cys Leu Met Asn His Pro Asp Leu Ala Lys Asp Leu
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aca gag tat ctt aaa gtg agg tca cat gac cct gag gaa gct att aga    1166
Thr Glu Tyr Leu Lys Val Arg Ser His Asp Pro Glu Glu Ala Ile Arg
                355                 360                 365

cat gat gtt att gtg tca ata gtt aca gct gct aaa aag gat att ctt    1214
His Asp Val Ile Val Ser Ile Val Thr Ala Ala Lys Lys Asp Ile Leu
                370                 375                 380

ctg gtc aat gat cac tta ctt aat ttt gtg aga gag aga aca tta gac    1262
Leu Val Asn Asp His Leu Leu Asn Phe Val Arg Glu Arg Thr Leu Asp
        385                 390                 395
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aaa cga tgg aga gta cgc aaa gaa gcc atg atg gga ctt gcc caa att        1310
Lys Arg Trp Arg Val Arg Lys Glu Ala Met Met Gly Leu Ala Gln Ile
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tat aag aaa tat gct tta cag tca gca gct gga aaa gat gct gca aaa        1358
Tyr Lys Lys Tyr Ala Leu Gln Ser Ala Ala Gly Lys Asp Ala Ala Lys
                420             425                 430

cag ata gca tgg atc aaa gac aaa ttg cta cat ata tat tat caa aat        1406
Gln Ile Ala Trp Ile Lys Asp Lys Leu Leu His Ile Tyr Tyr Gln Asn
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agt att gat gat cga cta ctt gtt gaa cgg atc ttt gct caa tac atg        1454
Ser Ile Asp Asp Arg Leu Leu Val Glu Arg Ile Phe Ala Gln Tyr Met
            450             455             460

gtt cct cac aat tta gaa act aca gaa cgg atg aaa tgc tta tat tac        1502
Val Pro His Asn Leu Glu Thr Thr Glu Arg Met Lys Cys Leu Tyr Tyr
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ttg tat gcc aca ctg gat tta aat gct gtg aaa gca ttg aat gaa atg        1550
Leu Tyr Ala Thr Leu Asp Leu Asn Ala Val Lys Ala Leu Asn Glu Met
480             485             490                 495

tgg aaa tgt caa aat ctg ctc cga cat caa gta aag gat ttg ctt gac        1598
Trp Lys Cys Gln Asn Leu Leu Arg His Gln Val Lys Asp Leu Leu Asp
                500             505             510

ttg att aag caa ccc aaa aca gat gcc agt gtc aag gcc ata ttt tca        1646
Leu Ile Lys Gln Pro Lys Thr Asp Ala Ser Val Lys Ala Ile Phe Ser
                515             520             525

aaa gtg atg gtt att aca aga aat tta cct gat cct ggt aag gct cag        1694
Lys Val Met Val Ile Thr Arg Asn Leu Pro Asp Pro Gly Lys Ala Gln
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gat ttc atg aag aaa ttc aca cag gtg tta gaa gat gat gag aaa ata        1742
Asp Phe Met Lys Lys Phe Thr Gln Val Leu Glu Asp Asp Glu Lys Ile
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aga aag cag tta gaa gta ctt gtt agt cca aca tgc tcc tgc aag cag        1790
Arg Lys Gln Leu Glu Val Leu Val Ser Pro Thr Cys Ser Cys Lys Gln
560             565             570             575

gct gaa ggt tgt gtg cgt gaa ata act aag aag ttg ggc aac ccc aaa        1838
Ala Glu Gly Cys Val Arg Glu Ile Thr Lys Lys Leu Gly Asn Pro Lys
                580             585             590

cag cct aca aat cct ttc ctg gaa atg atc aag ttt ctc ttg gag agg        1886
Gln Pro Thr Asn Pro Phe Leu Glu Met Ile Lys Phe Leu Leu Glu Arg
            595             600             605

ata gca cct gtg cac ata gat acc gaa tct atc agt gct ctt att aaa        1934
Ile Ala Pro Val His Ile Asp Thr Glu Ser Ile Ser Ala Leu Ile Lys
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caa gtg aac aaa tca ata gat gga aca gca gat gat gaa gat gag ggt        1982
Gln Val Asn Lys Ser Ile Asp Gly Thr Ala Asp Asp Glu Asp Glu Gly
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gtt cca act gat caa gcc atc aga gca ggt ctt gaa ctg ctt aag gta        2030
Val Pro Thr Asp Gln Ala Ile Arg Ala Gly Leu Glu Leu Leu Lys Val
640             645             650             655
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3

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ctc tca ttt aca cat ccc atc tca ttt cat tct gct gaa aca ttt gaa    2078
Leu Ser Phe Thr His Pro Ile Ser Phe His Ser Ala Glu Thr Phe Glu
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tca tta ctg gct tgt ctg aaa atg gat gat gaa aaa gta gca gaa gct    2126
Ser Leu Leu Ala Cys Leu Lys Met Asp Asp Glu Lys Val Ala Glu Ala
            675             680             685

gca cta caa att ttc aaa aac aca gga agc aaa att gaa gag gat ttt    2174
Ala Leu Gln Ile Phe Lys Asn Thr Gly Ser Lys Ile Glu Glu Asp Phe
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cca cac atc aga tca gcc ttg ctt cct gtt tta cat cac aaa tct aaa    2222
Pro His Ile Arg Ser Ala Leu Leu Pro Val Leu His His Lys Ser Lys
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aaa gga ccc ccc cgt caa gcc aaa tat gcc att cat tgt atc cat gcg    2270
Lys Gly Pro Pro Arg Gln Ala Lys Tyr Ala Ile His Cys Ile His Ala
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ata ttt tct agt aaa gag acc cag ttt gca cag ata ttt gag cct ctg    2318
Ile Phe Ser Ser Lys Glu Thr Gln Phe Ala Gln Ile Phe Glu Pro Leu
            740             745             750

cat aag agc cta gat cca agc aac ctg gaa cat ctc ata aca cca ttg    2366
His Lys Ser Leu Asp Pro Ser Asn Leu Glu His Leu Ile Thr Pro Leu
            755             760             765

gtt act att ggt cat att gct ctc ctt gca cct gat caa ttt gct gct    2414
Val Thr Ile Gly His Ile Ala Leu Leu Ala Pro Asp Gln Phe Ala Ala
            770             775             780

cct tgg aaa tct tgg gta gct act ttc att gtg aaa gat ctt ctc atg    2462
Pro Trp Lys Ser Trp Val Ala Thr Phe Ile Val Lys Asp Leu Leu Met
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aat gat cgg ctt cca ggg aaa aag aca act aaa ctt tgg gtt cca gat    2510
Asn Asp Arg Leu Pro Gly Lys Lys Thr Thr Lys Leu Trp Val Pro Asp
800             805             810             815

gaa gaa gta tct cct gag aca atg gtc aaa att cag gct att aaa atg    2558
Glu Glu Val Ser Pro Glu Thr Met Val Lys Ile Gln Ala Ile Lys Met
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atg gtt cga tgg cta ctt gga atg aaa aat aat cac agt aaa tca gga    2606
Met Val Arg Trp Leu Leu Gly Met Lys Asn Asn His Ser Lys Ser Gly
            835             840             845

act tct acc tta aga ttg cta aca aca ata ttg cat agt gat gga gac    2654
Thr Ser Thr Leu Arg Leu Leu Thr Thr Ile Leu His Ser Asp Gly Asp
            850             855             860

ttg aca gaa cag ggg aaa att agt aaa cca gat atg tca cgt ctg aga    2702
Leu Thr Glu Gln Gly Lys Ile Ser Lys Pro Asp Met Ser Arg Leu Arg
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ctt gct gct ggg agt gct att gtg aag ctg gca caa gaa ccc tgt tac    2750
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cat gaa atc atc aca tta gaa caa tat cag cta tgt gca tta gct atc    2798
His Glu Ile Ile Thr Leu Glu Gln Tyr Gln Leu Cys Ala Leu Ala Ile
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4

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aaa ggc ctt tcc cgt tta cgg ctt cca ctt gag tat atg gca atc tgt      2894
Lys Gly Leu Ser Arg Leu Arg Leu Pro Leu Glu Tyr Met Ala Ile Cys
            930             935             940

gcc ctt tgt gca aaa gat cct gta aag gag aga aga gct cat gct agg      2942
Ala Leu Cys Ala Lys Asp Pro Val Lys Glu Arg Arg Ala His Ala Arg
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caa tgt ttg gtg aaa aat ata aat gta agg cgg gag tat ctg aag cag      2990
Gln Cys Leu Val Lys Asn Ile Asn Val Arg Arg Glu Tyr Leu Lys Gln
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cat gca gct gtt agt gaa aaa tta ttg tct ctt cta cca gag tat gtt      3038
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Val Pro Tyr Thr Ile His Leu Leu Ala His Asp Pro Asp Tyr Val Lys
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gta cag gat att gaa caa ctt aaa gat gtt aaa gaa tgt ctt tgg ttt      3134
Val Gln Asp Ile Glu Gln Leu Lys Asp Val Lys Glu Cys Leu Trp Phe
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gtt ctg gaa ata tta atg gct aaa aat gaa aat aac agt cac gct ttt      3182
Val Leu Glu Ile Leu Met Ala Lys Asn Glu Asn Asn Ser His Ala Phe
    1025            1030            1035

atc aga aag atg gta gaa aat att aaa caa aca aaa gat gcc caa gga      3230
Ile Arg Lys Met Val Glu Asn Ile Lys Gln Thr Lys Asp Ala Gln Gly
1040            1045            1050            1055

cca gat gat gca aaa atg aat gaa aaa ctg tac act gtg tgt gat gtt      3278
Pro Asp Asp Ala Lys Met Asn Glu Lys Leu Tyr Thr Val Cys Asp Val
                1060            1065            1070

gcc atg aat atc atc atg tca aag agt act aca tac agt ttg gaa tct      3326
Ala Met Asn Ile Ile Met Ser Lys Ser Thr Thr Tyr Ser Leu Glu Ser
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cct aaa gac ccg gta cta cca gct cgt ttc ttc act caa cct gac aag      3374
Pro Lys Asp Pro Val Leu Pro Ala Arg Phe Phe Thr Gln Pro Asp Lys
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aat ttc agt aac acc aaa aat tat ctg cct cct gaa atg aaa tca ttt      3422
Asn Phe Ser Asn Thr Lys Asn Tyr Leu Pro Pro Glu Met Lys Ser Phe
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ttc act cct gga aaa cct aaa aca acc aat gtt cta gga gct gtt aac      3470
Phe Thr Pro Gly Lys Pro Lys Thr Thr Asn Val Leu Gly Ala Val Asn
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aag cca ctt tca tca gca ggc aag caa tct cag acc aaa tca tca cga      3518
Lys Pro Leu Ser Ser Ala Gly Lys Gln Ser Gln Thr Lys Ser Ser Arg
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atg gaa act gta agc aat gca agc agc agc tca aat cca agc tct cct      3566
Met Glu Thr Val Ser Asn Ala Ser Ser Ser Ser Asn Pro Ser Ser Pro
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gga aga ata aag ggg agg ctt gat agt tct gaa atg gat cac agt gaa    3614
Gly Arg Ile Lys Gly Arg Leu Asp Ser Ser Glu Met Asp His Ser Glu
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aat gaa gat tac aca atg tct tca cct ttg ccg ggg aaa aaa agt gac    3662
Asn Glu Asp Tyr Thr Met Ser Ser Pro Leu Pro Gly Lys Lys Ser Asp
    1185              1190              1195

aag aga gac gac tct gat ctt gta agg tct gaa ttg gag aag cct aga    3710
Lys Arg Asp Asp Ser Asp Leu Val Arg Ser Glu Leu Glu Lys Pro Arg
1200              1205              1210              1215

ggc agg aaa aaa acg ccc gtc aca gaa cag gag gag aaa tta ggt atg    3758
Gly Arg Lys Lys Thr Pro Val Thr Glu Gln Glu Glu Lys Leu Gly Met
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gat gac ttg act aag ttg gta cag gaa cag aaa cct aaa ggc agt cag    3806
Asp Asp Leu Thr Lys Leu Val Gln Glu Gln Lys Pro Lys Gly Ser Gln
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cga agt cgg aaa aga ggc cat acg gct tca gaa tct gat gaa cag cag    3854
Arg Ser Arg Lys Arg Gly His Thr Ala Ser Glu Ser Asp Glu Gln Gln
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tgg cct gag gaa aag agg ctc aaa gaa gat ata tta gaa aat gaa gat    3902
Trp Pro Glu Glu Lys Arg Leu Lys Glu Asp Ile Leu Glu Asn Glu Asp
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gaa cag aat agt ccg cca aaa aag ggt aaa aga ggc cga cca cca aaa    3950
Glu Gln Asn Ser Pro Pro Lys Lys Gly Lys Arg Gly Arg Pro Pro Lys
1280              1285              1290              1295

cct ctt ggt gga ggt aca cca aaa gaa gag cca aca atg aaa act tct    3998
Pro Leu Gly Gly Gly Thr Pro Lys Glu Glu Pro Thr Met Lys Thr Ser
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aaa aaa gga agc aaa aaa aaa tct gga cct cca gca cca gag gag gag    4046
Lys Lys Gly Ser Lys Lys Lys Ser Gly Pro Pro Ala Pro Glu Glu Glu
        1315              1320              1325

gaa gaa gaa gaa aga caa agt gga aat acg gaa cag aag tcc aaa agc    4094
Glu Glu Glu Glu Arg Gln Ser Gly Asn Thr Glu Gln Lys Ser Lys Ser
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aaa cag cac cga gtg tca agg aga gca cag cag aga gca gaa tct cct    4142
Lys Gln His Arg Val Ser Arg Arg Ala Gln Gln Arg Ala Glu Ser Pro
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gaa tct agt gca att gaa tcc aca cag tcc aca cca cag aaa gga cga    4190
Glu Ser Ser Ala Ile Glu Ser Thr Gln Ser Thr Pro Gln Lys Gly Arg
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gga aga cca tca aaa acg cca tca cca tca caa cca aaa aaa aat gtg    4238
Gly Arg Pro Ser Lys Thr Pro Ser Pro Ser Gln Pro Lys Lys Asn Val
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tgtaaacata catattgctg tatttaaatt ccatatattt agccccatta cactaggtac   4358

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6

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             35                  40                  45

Ser Glu Glu Glu Lys Glu Leu Tyr Leu Asn Leu Ala Leu His Leu Ala
         50                  55                  60

Ser Asp Phe Phe Leu Lys His Pro Gly Lys Asp Val Arg Leu Leu Val
     65                  70                  75                  80

Ala Cys Cys Leu Ala Asp Ile Phe Arg Ile Tyr Ala Pro Glu Ala Pro
                 85                  90                  95

Tyr Thr Ser Pro Asp Lys Leu Lys Asp Ile Phe Met Phe Ile Thr Arg
                100                 105                 110

Gln Leu Lys Gly Leu Glu Asp Thr Lys Ser Pro Gln Phe Asn Arg Tyr
             115                 120                 125

Phe Tyr Leu Leu Glu Asn Ile Ala Trp Val Lys Ser Tyr Asn Ile Cys
         130                 135                 140

Phe Glu Leu Glu Asp Ser Asn Glu Ile Phe Thr Gln Leu Tyr Arg Thr
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7

Leu Phe Ser Val Ile Asn Asn Gly His Asn Gln Lys Val His Met His
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Met Val Asp Leu Met Ser Ser Ile Ile Cys Glu Gly Asp Thr Val Ser
                180   185   190

Gln Glu Leu Leu Asp Thr Val Leu Val Asn Leu Val Pro Ala His Lys
            195   200   205

Asn Leu Asn Lys Gln Ala Tyr Asp Leu Ala Lys Ala Leu Leu Lys Arg
        210   215   220

Thr Ala Gln Ala Ile Glu Pro Tyr Ile Thr Thr Phe Phe Asn Gln Val
225   230   235   240

Leu Met Leu Gly Lys Thr Ser Ile Ser Asp Leu Ser Glu His Val Phe
                245   250   255

Asp Leu Ile Leu Glu Leu Tyr Asn Ile Asp Ser His Leu Leu Leu Ser
            260   265   270

Val Leu Pro Gln Leu Glu Phe Lys Leu Lys Ser Asn Asp Asn Glu Glu
        275   280   285

Arg Leu Gln Val Val Lys Leu Leu Ala Lys Met Phe Gly Ala Lys Asp
        290   295   300

Ser Glu Leu Ala Ser Gln Asn Lys Pro Leu Trp Gln Cys Tyr Leu Gly
305   310   315   320

Arg Phe Asn Asp Ile His Val Pro Ile Arg Leu Glu Cys Val Lys Phe
                325   330   335

Ala Ser His Cys Leu Met Asn His Pro Asp Leu Ala Lys Asp Leu Thr
                340   345   350

Glu Tyr Leu Lys Val Arg Ser His Asp Pro Glu Glu Ala Ile Arg His
            355   360   365

Asp Val Ile Val Ser Ile Val Thr Ala Ala Lys Lys Asp Ile Leu Leu
        370   375   380

Val Asn Asp His Leu Leu Asn Phe Val Arg Glu Arg Thr Leu Asp Lys
385   390   395   400

Arg Trp Arg Val Arg Lys Glu Ala Met Met Gly Leu Ala Gln Ile Tyr
                405   410   415

Lys Lys Tyr Ala Leu Gln Ser Ala Ala Gly Lys Asp Ala Ala Lys Gln
            420   425   430

Ile Ala Trp Ile Lys Asp Lys Leu Leu His Ile Tyr Tyr Gln Asn Ser
            435   440   445

Ile Asp Asp Arg Leu Leu Val Glu Arg Ile Phe Ala Gln Tyr Met Val
        450   455   460

Pro His Asn Leu Glu Thr Thr Glu Arg Met Lys Cys Leu Tyr Tyr Leu
465   470   475   480

Tyr Ala Thr Leu Asp Leu Asn Ala Val Lys Ala Leu Asn Glu Met Trp
                485   490   495

8

Lys Cys Gln Asn Leu Leu Arg His Gln Val Lys Asp Leu Leu Asp Leu
      500   505   510

Ile Lys Gln Pro Lys Thr Asp Ala Ser Val Lys Ala Ile Phe Ser Lys
      515   520   525

Val Met Val Ile Thr Arg Asn Leu Pro Asp Pro Gly Lys Ala Gln Asp
    530   535   540

Phe Met Lys Lys Phe Thr Gln Val Leu Glu Asp Asp Glu Lys Ile Arg
545   550   555   560

Lys Gln Leu Glu Val Leu Val Ser Pro Thr Cys Ser Cys Lys Gln Ala
           565   570   575

Glu Gly Cys Val Arg Glu Ile Thr Lys Lys Leu Gly Asn Pro Lys Gln
        580   585   590

Pro Thr Asn Pro Phe Leu Glu Met Ile Lys Phe Leu Leu Glu Arg Ile
      595   600   605

Ala Pro Val His Ile Asp Thr Glu Ser Ile Ser Ala Leu Ile Lys Gln
    610   615   620

Val Asn Lys Ser Ile Asp Gly Thr Ala Asp Asp Glu Asp Glu Gly Val
625   630   635   640

Pro Thr Asp Gln Ala Ile Arg Ala Gly Leu Glu Leu Leu Lys Val Leu
           645   650   655

Ser Phe Thr His Pro Ile Ser Phe His Ser Ala Glu Thr Phe Glu Ser
           660   665   670

Leu Leu Ala Cys Leu Lys Met Asp Asp Glu Lys Val Ala Glu Ala Ala
           675   680   685

Leu Gln Ile Phe Lys Asn Thr Gly Ser Lys Ile Glu Glu Asp Phe Pro
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His Ile Arg Ser Ala Leu Leu Pro Val Leu His His Lys Ser Lys Lys
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Gly Pro Pro Arg Gln Ala Lys Tyr Ala Ile His Cys Ile His Ala Ile
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Phe Ser Ser Lys Glu Thr Gln Phe Ala Gln Ile Phe Glu Pro Leu His
           740   745   750

Lys Ser Leu Asp Pro Ser Asn Leu Glu His Leu Ile Thr Pro Leu Val
           755   760   765

Thr Ile Gly His Ile Ala Leu Leu Ala Pro Asp Gln Phe Ala Ala Pro
    770   775   780

Trp Lys Ser Trp Val Ala Thr Phe Ile Val Lys Asp Leu Leu Met Asn
785   790   795   800

Asp Arg Leu Pro Gly Lys Lys Thr Thr Lys Leu Trp Val Pro Asp Glu
           805   810   815

Glu Val Ser Pro Glu Thr Met Val Lys Ile Gln Ala Ile Lys Met Met
           820   825   830

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Val Arg Trp Leu Leu Gly Met Lys Asn Asn His Ser Lys Ser Gly Thr
    835                 840                 845

Ser Thr Leu Arg Leu Leu Thr Thr Ile Leu His Ser Asp Gly Asp Leu
    850                 855                 860

Thr Glu Gln Gly Lys Ile Ser Lys Pro Asp Met Ser Arg Leu Arg Leu
865                 870                 875                 880

Ala Ala Gly Ser Ala Ile Val Lys Leu Ala Gln Glu Pro Cys Tyr His
                885                 890                 895

Glu Ile Ile Thr Leu Glu Gln Tyr Gln Leu Cys Ala Leu Ala Ile Asn
                900                 905                 910

Asp Glu Cys Tyr Gln Val Arg Gln Val Phe Ala Gln Lys Leu His Lys
    915                 920                 925

Gly Leu Ser Arg Leu Arg Leu Pro Leu Glu Tyr Met Ala Ile Cys Ala
    930                 935                 940

Leu Cys Ala Lys Asp Pro Val Lys Glu Arg Arg Ala His Ala Arg Gln
945                 950                 955                 960

Cys Leu Val Lys Asn Ile Asn Val Arg Arg Glu Tyr Leu Lys Gln His
                965                 970                 975

Ala Ala Val Ser Glu Lys Leu Leu Ser Leu Leu Pro Glu Tyr Val Val
                980                 985                 990

Pro Tyr Thr Ile His Leu Leu Ala His Asp Pro Asp Tyr Val Lys Val
        995                 1000                 1005

Gln Asp Ile Glu Gln Leu Lys Asp Val Lys Glu Cys Leu Trp Phe Val
    1010                 1015                 1020

Leu Glu Ile Leu Met Ala Lys Asn Glu Asn Asn Ser His Ala Phe Ile
025                 1030                 1035                 104

Arg Lys Met Val Glu Asn Ile Lys Gln Thr Lys Asp Ala Gln Gly Pro
            1045                 1050                 1055

Asp Asp Ala Lys Met Asn Glu Lys Leu Tyr Thr Val Cys Asp Val Ala
        1060                 1065                 1070

Met Asn Ile Ile Met Ser Lys Ser Thr Thr Tyr Ser Leu Glu Ser Pro
        1075                 1080                 1085

Lys Asp Pro Val Leu Pro Ala Arg Phe Phe Thr Gln Pro Asp Lys Asn
    1090                 1095                 1100

Phe Ser Asn Thr Lys Asn Tyr Leu Pro Pro Glu Met Lys Ser Phe Phe
105                 1110                 1115                 112

Thr Pro Gly Lys Pro Lys Thr Thr Asn Val Leu Gly Ala Val Asn Lys
            1125                 1130                 1135

Pro Leu Ser Ser Ala Gly Lys Gln Ser Gln Thr Lys Ser Ser Arg Met
        1140                 1145                 1150

Glu Thr Val Ser Asn Ala Ser Ser Ser Ser Asn Pro Ser Ser Pro Gly
    1155                 1160                 1165

Arg Ile Lys Gly Arg Leu Asp Ser Ser Glu Met Asp His Ser Glu Asn
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Glu Asp Tyr Thr Met Ser Ser Pro Leu Pro Gly Lys Lys Ser Asp Lys
185                 1190                1195                120

Arg Asp Asp Ser Asp Leu Val Arg Ser Glu Leu Glu Lys Pro Arg Gly
            1205                1210                1215

Arg Lys Lys Thr Pro Val Thr Glu Gln Glu Glu Lys Leu Gly Met Asp
          1220                1225                1230

Asp Leu Thr Lys Leu Val Gln Glu Gln Lys Pro Lys Gly Ser Gln Arg
        1235                1240                1245

Ser Arg Lys Arg Gly His Thr Ala Ser Glu Ser Asp Glu Gln Gln Trp
    1250                1255                1260

Pro Glu Glu Lys Arg Leu Lys Glu Asp Ile Leu Glu Asn Glu Asp Glu
265                 1270                1275                128

Gln Asn Ser Pro Pro Lys Lys Gly Lys Arg Gly Arg Pro Pro Lys Pro
            1285                1290                1295

Leu Gly Gly Gly Thr Pro Lys Glu Glu Pro Thr Met Lys Thr Ser Lys
          1300                1305                1310

Lys Gly Ser Lys Lys Lys Ser Gly Pro Pro Ala Pro Glu Glu Glu Glu
      1315                1320                1325

Glu Glu Glu Arg Gln Ser Gly Asn Thr Glu Gln Lys Ser Lys Ser Lys
  1330                1335                1340

Gln His Arg Val Ser Arg Arg Ala Gln Gln Arg Ala Glu Ser Pro Glu
345                 1350                1355                136

Ser Ser Ala Ile Glu Ser Thr Gln Ser Thr Pro Gln Lys Gly Arg Gly
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Arg Pro Ser Lys Thr Pro Ser Pro Ser Gln Pro Lys Lys Asn Val
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  1               5                   10                  15

cct ggg gtc aag gaa ata tca gat aaa ata tct aaa gag gag atg gtg      96
Pro Gly Val Lys Glu Ile Ser Asp Lys Ile Ser Lys Glu Glu Met Val
              20                  25                  30

aga cga tta aag atg gtt gtg aaa act ttt atg gat atg gac cag gac     144
Arg Arg Leu Lys Met Val Val Lys Thr Phe Met Asp Met Asp Gln Asp
          35                  40                  45
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tct gaa gaa gaa aag gag ctt tat tta aac cta gct tta cat ctt gct      192
Ser Glu Glu Glu Lys Glu Leu Tyr Leu Asn Leu Ala Leu His Leu Ala
     50              55              60

tca gat ttt ttt ctc aag cat cct ggt aaa gat gtt cgc tta ctg gta      240
Ser Asp Phe Phe Leu Lys His Pro Gly Lys Asp Val Arg Leu Leu Val
65              70              75              80

gcc tgc tgc ctt gct gat att ttc agg att tat gct cct gaa gct cct      288
Ala Cys Cys Leu Ala Asp Ile Phe Arg Ile Tyr Ala Pro Glu Ala Pro
                85              90              95

tac aca tcc cct gat aaa cta aag gat ata ttt atg ttt ata aca aga      336
Tyr Thr Ser Pro Asp Lys Leu Lys Asp Ile Phe Met Phe Ile Thr Arg
            100             105             110

cag ttg aag ggg cta gag gat aca aag agc cca caa ttc aat agg tat      384
Gln Leu Lys Gly Leu Glu Asp Thr Lys Ser Pro Gln Phe Asn Arg Tyr
        115             120             125

ttt tat tta ctt gag aac att gct tgg gtc aag tca tat aac ata tgc      432
Phe Tyr Leu Leu Glu Asn Ile Ala Trp Val Lys Ser Tyr Asn Ile Cys
    130             135             140

ttt gag tta gaa gat agc aat gaa att ttc acc cag cta tac aga acc      480
Phe Glu Leu Glu Asp Ser Asn Glu Ile Phe Thr Gln Leu Tyr Arg Thr
145             150             155             160

tta ttt tca gtt ata aac aat ggc cac aat cag aaa gtc cat atg cac      528
Leu Phe Ser Val Ile Asn Asn Gly His Asn Gln Lys Val His Met His
                165             170             175

atg gta gac ctt atg agc tct att att tgt gaa ggt gat aca gtg tct      576
Met Val Asp Leu Met Ser Ser Ile Ile Cys Glu Gly Asp Thr Val Ser
            180             185             190

cag gag ctt ttg gat acg gtt tta gta aat ctg gta cct gct cat aag      624
Gln Glu Leu Leu Asp Thr Val Leu Val Asn Leu Val Pro Ala His Lys
        195             200             205

aat tta aac aag caa gca tat gat ttg gca aag gct tta ctg aag agg      672
Asn Leu Asn Lys Gln Ala Tyr Asp Leu Ala Lys Ala Leu Leu Lys Arg
    210             215             220

aca gct caa gct att gag cca tat att acc act ttt ttt aat cag gtt      720
Thr Ala Gln Ala Ile Glu Pro Tyr Ile Thr Thr Phe Phe Asn Gln Val
225             230             235             240

ctg atg ctt ggg aaa aca tct atc agc gat ttg tca gag cat gtc ttt      768
Leu Met Leu Gly Lys Thr Ser Ile Ser Asp Leu Ser Glu His Val Phe
            245             250             255

gac tta att ttg gag ctc tac aat att gat agt cat ttg ctg ctc tct      816
Asp Leu Ile Leu Glu Leu Tyr Asn Ile Asp Ser His Leu Leu Leu Ser
            260             265             270

gtt tta ccc cag ctt gaa ttt aaa tta aag agc aat gat aat gag gag      864
Val Leu Pro Gln Leu Glu Phe Lys Leu Lys Ser Asn Asp Asn Glu Glu
        275             280             285

cgc cta caa gtt gtt aaa cta ctg gca aaa atg ttt ggg gca aag gat      912
Arg Leu Gln Val Val Lys Leu Leu Ala Lys Met Phe Gly Ala Lys Asp
    290             295             300
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12

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tca gaa ttg gct tct caa aac aag cca ctt tgg cag tgc tac ttg ggc    960
Ser Glu Leu Ala Ser Gln Asn Lys Pro Leu Trp Gln Cys Tyr Leu Gly
305                 310                 315                 320

agg ttt aat gat atc cat gta cca atc cgc ctg gaa tgt gtg aaa ttt    1008
Arg Phe Asn Asp Ile His Val Pro Ile Arg Leu Glu Cys Val Lys Phe
                325                 330                 335

gct agc cat tgt ctc atg aac cat cct gat tta gca aaa gac tta aca    1056
Ala Ser His Cys Leu Met Asn His Pro Asp Leu Ala Lys Asp Leu Thr
                340                 345                 350

gag tat ctt aaa gtg agg tca cat gac cct gag gaa gct att aga cat    1104
Glu Tyr Leu Lys Val Arg Ser His Asp Pro Glu Glu Ala Ile Arg His
                355                 360                 365

gat gtt att gtg tca ata gtt aca gct gct aaa aag gat att ctt ctg    1152
Asp Val Ile Val Ser Ile Val Thr Ala Ala Lys Lys Asp Ile Leu Leu
        370                 375                 380

gtc aat gat cac tta ctt aat ttt gtg aga gag aga aca tta gac aaa    1200
Val Asn Asp His Leu Leu Asn Phe Val Arg Glu Arg Thr Leu Asp Lys
385                 390                 395                 400

cga tgg aga gta cgc aaa gaa gcc atg atg gga ctt gcc caa att tat    1248
Arg Trp Arg Val Arg Lys Glu Ala Met Met Gly Leu Ala Gln Ile Tyr
                405                 410                 415

aag aaa tat gct tta cag tca gca gct gga aaa gat gct gca aaa cag    1296
Lys Lys Tyr Ala Leu Gln Ser Ala Ala Gly Lys Asp Ala Ala Lys Gln
                420                 425                 430

ata gca tgg atc aaa gac aaa ttg cta cat ata tat tat caa aat agt    1344
Ile Ala Trp Ile Lys Asp Lys Leu Leu His Ile Tyr Tyr Gln Asn Ser
                435                 440                 445

att gat gat cga cta ctt gtt gaa cgg atc ttt gct caa tac atg gtt    1392
Ile Asp Asp Arg Leu Leu Val Glu Arg Ile Phe Ala Gln Tyr Met Val
        450                 455                 460

cct cac aat tta gaa act aca gaa cgg atg aaa tgc tta tat tac ttg    1440
Pro His Asn Leu Glu Thr Thr Glu Arg Met Lys Cys Leu Tyr Tyr Leu
465                 470                 475                 480

tat gcc aca ctg gat tta aat gct gtg aaa gca ttg aat gaa atg tgg    1488
Tyr Ala Thr Leu Asp Leu Asn Ala Val Lys Ala Leu Asn Glu Met Trp
                485                 490                 495

aaa tgt caa aat ctg ctc cga cat caa gta aag gat ttg ctt gac ttg    1536
Lys Cys Gln Asn Leu Leu Arg His Gln Val Lys Asp Leu Leu Asp Leu
                500                 505                 510

att aag caa ccc aaa aca gat gcc agt gtc aag gcc ata ttt tca aaa    1584
Ile Lys Gln Pro Lys Thr Asp Ala Ser Val Lys Ala Ile Phe Ser Lys
                515                 520                 525

gtg atg gtt att aca aga aat tta cct gat cct ggt aag gct cag gat    1632
Val Met Val Ile Thr Arg Asn Leu Pro Asp Pro Gly Lys Ala Gln Asp
        530                 535                 540

ttc atg aag aaa ttc aca cag gtg tta gaa gat gat gag aaa ata aga    1680
Phe Met Lys Lys Phe Thr Gln Val Leu Glu Asp Asp Glu Lys Ile Arg
545                 550                 555                 560
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13

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aag cag tta gaa gta ctt gtt agt cca aca tgc tcc tgc aag cag gct    1728
Lys Gln Leu Glu Val Leu Val Ser Pro Thr Cys Ser Cys Lys Gln Ala
                565                 570                 575

gaa ggt tgt gtg cgt gaa ata act aag aag ttg ggc aac ccc aaa cag    1776
Glu Gly Cys Val Arg Glu Ile Thr Lys Lys Leu Gly Asn Pro Lys Gln
            580                 585                 590

cct aca aat cct ttc ctg gaa atg atc aag ttt ctc ttg gag agg ata    1824
Pro Thr Asn Pro Phe Leu Glu Met Ile Lys Phe Leu Leu Glu Arg Ile
            595                 600                 605

gca cct gtg cac ata gat acc gaa tct atc agt gct ctt att aaa caa    1872
Ala Pro Val His Ile Asp Thr Glu Ser Ile Ser Ala Leu Ile Lys Gln
    610                 615                 620

gtg aac aaa tca ata gat gga aca gca gat gat gaa gat gag ggt gtt    1920
Val Asn Lys Ser Ile Asp Gly Thr Ala Asp Asp Glu Asp Glu Gly Val
625                 630                 635                 640

cca act gat caa gcc atc aga gca ggt ctt gaa ctg ctt aag gta ctc    1968
Pro Thr Asp Gln Ala Ile Arg Ala Gly Leu Glu Leu Leu Lys Val Leu
                645                 650                 655

tca ttt aca cat ccc atc tca ttt cat tct gct gaa aca ttt gaa tca    2016
Ser Phe Thr His Pro Ile Ser Phe His Ser Ala Glu Thr Phe Glu Ser
            660                 665                 670

tta ctg gct tgt ctg aaa atg gat gat gaa aaa gta gca gaa gct gca    2064
Leu Leu Ala Cys Leu Lys Met Asp Asp Glu Lys Val Ala Glu Ala Ala
            675                 680                 685

cta caa att ttc aaa aac aca gga agc aaa att gaa gag gat ttt cca    2112
Leu Gln Ile Phe Lys Asn Thr Gly Ser Lys Ile Glu Glu Asp Phe Pro
    690                 695                 700

cac atc aga tca gcc ttg ctt cct gtt tta cat cac aaa tct aaa aaa    2160
His Ile Arg Ser Ala Leu Leu Pro Val Leu His His Lys Ser Lys Lys
705                 710                 715                 720

gga ccc ccc cgt caa gcc aaa tat gcc att cat tgt atc cat gcg ata    2208
Gly Pro Pro Arg Gln Ala Lys Tyr Ala Ile His Cys Ile His Ala Ile
                725                 730                 735

ttt tct agt aaa gag acc cag ttt gca cag ata ttt gag cct ctg cat    2256
Phe Ser Ser Lys Glu Thr Gln Phe Ala Gln Ile Phe Glu Pro Leu His
            740                 745                 750

aag agc cta gat cca agc aac ctg gaa cat ctc ata aca cca ttg gtt    2304
Lys Ser Leu Asp Pro Ser Asn Leu Glu His Leu Ile Thr Pro Leu Val
            755                 760                 765

act att ggt cat att gct ctc ctt gca cct gat caa ttt gct gct cct    2352
Thr Ile Gly His Ile Ala Leu Leu Ala Pro Asp Gln Phe Ala Ala Pro
    770                 775                 780

tgg aaa tct tgg gta gct act ttc att gtg aaa gat ctt ctc atg aat    2400
Trp Lys Ser Trp Val Ala Thr Phe Ile Val Lys Asp Leu Leu Met Asn
785                 790                 795                 800

gat cgg ctt cca ggg aaa aag aca act aaa ctt tgg gtt cca gat gaa    2448
Asp Arg Leu Pro Gly Lys Lys Thr Thr Lys Leu Trp Val Pro Asp Glu
                805                 810                 815
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14

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gaa gta tct cct gag aca atg gtc aaa att cag gct att aaa atg atg      2496
Glu Val Ser Pro Glu Thr Met Val Lys Ile Gln Ala Ile Lys Met Met
            820             825             830

gtt cga tgg cta ctt gga atg aaa aat aat cac agt aaa tca gga act      2544
Val Arg Trp Leu Leu Gly Met Lys Asn Asn His Ser Lys Ser Gly Thr
            835             840             845

tct acc tta aga ttg cta aca aca ata ttg cat agt gat gga gac ttg      2592
Ser Thr Leu Arg Leu Leu Thr Thr Ile Leu His Ser Asp Gly Asp Leu
    850             855             860

aca gaa cag ggg aaa att agt aaa cca gat atg tca cgt ctg aga ctt      2640
Thr Glu Gln Gly Lys Ile Ser Lys Pro Asp Met Ser Arg Leu Arg Leu
865             870             875             880

gct gct ggg agt gct att gtg aag ctg gca caa gaa ccc tgt tac cat      2688
Ala Ala Gly Ser Ala Ile Val Lys Leu Ala Gln Glu Pro Cys Tyr His
            885             890             895

gaa atc atc aca tta gaa caa tat cag cta tgt gca tta gct atc aac      2736
Glu Ile Ile Thr Leu Glu Gln Tyr Gln Leu Cys Ala Leu Ala Ile Asn
            900             905             910

gat gaa tgc tat caa gta aga caa gtg ttt gcc cag aaa ctt cac aaa      2784
Asp Glu Cys Tyr Gln Val Arg Gln Val Phe Ala Gln Lys Leu His Lys
            915             920             925

ggc ctt tcc cgt tta cgg ctt cca ctt gag tat atg gca atc tgt gcc      2832
Gly Leu Ser Arg Leu Arg Leu Pro Leu Glu Tyr Met Ala Ile Cys Ala
    930             935             940

ctt tgt gca aaa gat cct gta aag gag aga aga gct cat gct agg caa      2880
Leu Cys Ala Lys Asp Pro Val Lys Glu Arg Arg Ala His Ala Arg Gln
945             950             955             960

tgt ttg gtg aaa aat ata aat gta agg cgg gag tat ctg aag cag cat      2928
Cys Leu Val Lys Asn Ile Asn Val Arg Arg Glu Tyr Leu Lys Gln His
            965             970             975

gca gct gtt agt gaa aaa tta ttg tct ctt cta cca gag tat gtt gtt      2976
Ala Ala Val Ser Glu Lys Leu Leu Ser Leu Leu Pro Glu Tyr Val Val
            980             985             990

cca tat aca att cac ctt ttg gca cat gac cca gat tat gtc aaa gta      3024
Pro Tyr Thr Ile His Leu Leu Ala His Asp Pro Asp Tyr Val Lys Val
            995             1000            1005

cag gat att gaa caa ctt aaa gat gtt aaa gaa tgt ctt tgg ttt gtt      3072
Gln Asp Ile Glu Gln Leu Lys Asp Val Lys Glu Cys Leu Trp Phe Val
    1010            1015            1020

ctg gaa ata tta atg gct aaa aat gaa aat aac agt cac gct ttt atc      3120
Leu Glu Ile Leu Met Ala Lys Asn Glu Asn Asn Ser His Ala Phe Ile
1025            1030            1035            1040

aga aag atg gta gaa aat att aaa caa aca aaa gat gcc caa gga cca      3168
Arg Lys Met Val Glu Asn Ile Lys Gln Thr Lys Asp Ala Gln Gly Pro
            1045            1050            1055

gat gat gca aaa atg aat gaa aaa ctg tac act gtg tgt gat gtt gcc      3216
Asp Asp Ala Lys Met Asn Glu Lys Leu Tyr Thr Val Cys Asp Val Ala
            1060            1065            1070
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15

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atg aat atc atc atg tca aag agt act aca tac agt ttg gaa tct cct    3264
Met Asn Ile Ile Met Ser Lys Ser Thr Thr Tyr Ser Leu Glu Ser Pro
        1075                1080                1085

aaa gac ccg gta cta cca gct cgt ttc ttc act caa cct gac aag aat    3312
Lys Asp Pro Val Leu Pro Ala Arg Phe Phe Thr Gln Pro Asp Lys Asn
        1090                1095                1100

ttc agt aac acc aaa aat tat ctg cct cct gaa atg aaa tca ttt ttc    3360
Phe Ser Asn Thr Lys Asn Tyr Leu Pro Pro Glu Met Lys Ser Phe Phe
1105                1110                1115                1120

act cct gga aaa cct aaa aca acc aat gtt cta gga gct gtt aac aag    3408
Thr Pro Gly Lys Pro Lys Thr Thr Asn Val Leu Gly Ala Val Asn Lys
                1125                1130                1135

cca ctt tca tca gca ggc aag caa tct cag acc aaa tca tca cga atg    3456
Pro Leu Ser Ser Ala Gly Lys Gln Ser Gln Thr Lys Ser Ser Arg Met
            1140                1145                1150

gaa act gta agc aat gca agc agc agc tca aat cca agc tct cct gga    3504
Glu Thr Val Ser Asn Ala Ser Ser Ser Ser Asn Pro Ser Ser Pro Gly
        1155                1160                1165

aga ata aag ggg agg ctt gat agt tct gaa atg gat cac agt gaa aat    3552
Arg Ile Lys Gly Arg Leu Asp Ser Ser Glu Met Asp His Ser Glu Asn
        1170                1175                1180

gaa gat tac aca atg tct tca cct ttg ccg ggg aaa aaa agt gac aag    3600
Glu Asp Tyr Thr Met Ser Ser Pro Leu Pro Gly Lys Lys Ser Asp Lys
1185                1190                1195                1200

aga gac gac tct gat ctt gta agg tct gaa ttg gag aag cct aga ggc    3648
Arg Asp Asp Ser Asp Leu Val Arg Ser Glu Leu Glu Lys Pro Arg Gly
                1205                1210                1215

agg aaa aaa acg ccc gtc aca gaa cag gag gag aaa tta ggt atg gat    3696
Arg Lys Lys Thr Pro Val Thr Glu Gln Glu Glu Lys Leu Gly Met Asp
            1220                1225                1230

gac ttg act aag ttg gta cag gaa cag aaa cct aaa ggc agt cag cga    3744
Asp Leu Thr Lys Leu Val Gln Glu Gln Lys Pro Lys Gly Ser Gln Arg
        1235                1240                1245

agt cgg aaa aga ggc cat acg gct tca gaa tct gat gaa cag cag tgg    3792
Ser Arg Lys Arg Gly His Thr Ala Ser Glu Ser Asp Glu Gln Gln Trp
        1250                1255                1260

cct gag gaa aag agg ctc aaa gaa gat ata tta gaa aat gaa gat gaa    3840
Pro Glu Glu Lys Arg Leu Lys Glu Asp Ile Leu Glu Asn Glu Asp Glu
1265                1270                1275                1280

cag aat agt ccg cca aaa aag ggt aaa aga ggc cga cca cca aaa cct    3888
Gln Asn Ser Pro Pro Lys Lys Gly Lys Arg Gly Arg Pro Pro Lys Pro
                1285                1290                1295

ctt ggt gga ggt aca cca aaa gaa gag cca aca atg aaa act tct aaa    3936
Leu Gly Gly Gly Thr Pro Lys Glu Glu Pro Thr Met Lys Thr Ser Lys
                1300                1305                1310

aaa gga agc aaa aaa aaa tct gga cct cca gca cca gag gag gag gaa    3984
Lys Gly Ser Lys Lys Lys Ser Gly Pro Pro Ala Pro Glu Glu Glu Glu
        1315                1320                1325
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16

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gaa gaa gaa aga caa agt gga aat acg gaa cag aag tcc aaa agc aaa   4032
Glu Glu Glu Arg Gln Ser Gly Asn Thr Glu Gln Lys Ser Lys Ser Lys
        1330            1335            1340

cag cac cga gtg tca agg aga gca cag cag aga gca gaa tct cct gaa   4080
Gln His Arg Val Ser Arg Arg Ala Gln Gln Arg Ala Glu Ser Pro Glu
1345            1350            1355            1360

tct agt gca att gaa tcc aca cag tcc aca cca cag aaa gga cga gga   4128
Ser Ser Ala Ile Glu Ser Thr Gln Ser Thr Pro Gln Lys Gly Arg Gly
            1365            1370            1375

aga cca tca aaa acg cca tca cca tca caa cca aaa aaa aat gtg       4173
Arg Pro Ser Lys Thr Pro Ser Pro Ser Gln Pro Lys Lys Asn Val
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caacccggag gggtagaaat atttctgtc atg gct cat tca aag act agg acc   173
                                Met Ala His Ser Lys Thr Arg Thr
                                1               5

aat gat gga aaa att aca tat ccg cct ggg gtc aag gaa ata tca gat   221
Asn Asp Gly Lys Ile Thr Tyr Pro Pro Gly Val Lys Glu Ile Ser Asp
        10              15              20

aaa ata tct aaa gag gag atg gtg aga cga tta aag atg gtt gtg aaa   269
Lys Ile Ser Lys Glu Glu Met Val Arg Arg Leu Lys Met Val Val Lys
 25             30              35              40

act ttt atg gat atg gac cag gac tct gaa gaa gaa aag gag ctt tat   317
Thr Phe Met Asp Met Asp Gln Asp Ser Glu Glu Glu Lys Glu Leu Tyr
                45              50              55

tta aac cta gct tta cat ctt gct tca gat ttt ttt ctc aag cat cct   365
Leu Asn Leu Ala Leu His Leu Ala Ser Asp Phe Phe Leu Lys His Pro
                60              65              70

ggt aaa gat gtt cgc tta ctg gta gcc tgc tgc ctt gct gat att ttc   413
Gly Lys Asp Val Arg Leu Leu Val Ala Cys Cys Leu Ala Asp Ile Phe
            75              80              85

agg att tat gct cct gaa gct cct tac aca tcc cct gat aaa cta aag   461
Arg Ile Tyr Ala Pro Glu Ala Pro Tyr Thr Ser Pro Asp Lys Leu Lys
        90              95              100

gat ata ttt atg ttt ata aca aga cag ttg aag ggg cta gag gat aca   509
Asp Ile Phe Met Phe Ile Thr Arg Gln Leu Lys Gly Leu Glu Asp Thr
105             110             115             120

aag agc cca caa ttc aat agg tat ttt tat tta ctt gag aac att gct   557
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17

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Lys Ser Pro Gln Phe Asn Arg Tyr Phe Tyr Leu Leu Glu Asn Ile Ala
            125             130             135

tgg gtc aag tca tat aac ata tgc ttt gag tta gaa gat agc aat gaa    605
Trp Val Lys Ser Tyr Asn Ile Cys Phe Glu Leu Glu Asp Ser Asn Glu
            140             145             150

att ttc acc cag cta tac aga acc tta ttt tca gtt ata aac aat ggc    653
Ile Phe Thr Gln Leu Tyr Arg Thr Leu Phe Ser Val Ile Asn Asn Gly
            155             160             165

cac aat cag aaa gtc cat atg cac atg gta gac ctt atg agc tct att    701
His Asn Gln Lys Val His Met His Met Val Asp Leu Met Ser Ser Ile
            170             175             180

att tgt gaa ggt gat aca gtg tct cag gag ctt ttg gat acg gtt tta    749
Ile Cys Glu Gly Asp Thr Val Ser Gln Glu Leu Leu Asp Thr Val Leu
185             190             195             200

gta aat ctg gta cct gct cat aag aat tta aac aag caa gca tat gat    797
Val Asn Leu Val Pro Ala His Lys Asn Leu Asn Lys Gln Ala Tyr Asp
            205             210             215

ttg gca aag gct tta ctg aag agg aca gct caa gct att gag cca tat    845
Leu Ala Lys Ala Leu Leu Lys Arg Thr Ala Gln Ala Ile Glu Pro Tyr
            220             225             230

att acc act ttt ttt aat cag gtt ctg atg ctt ggg aaa aca tct atc    893
Ile Thr Thr Phe Phe Asn Gln Val Leu Met Leu Gly Lys Thr Ser Ile
            235             240             245

agc gat ttg tca gag cat gtc ttt gac tta att ttg gag ctc tac aat    941
Ser Asp Leu Ser Glu His Val Phe Asp Leu Ile Leu Glu Leu Tyr Asn
            250             255             260

att gat agt cat ttg ctg ctc tct gtt tta ccc cag ctt gaa ttt aaa    989
Ile Asp Ser His Leu Leu Leu Ser Val Leu Pro Gln Leu Glu Phe Lys
265             270             275             280

tta aag agc aat gat aat gag gag cgc cta caa gtt gtt aaa cta ctg   1037
Leu Lys Ser Asn Asp Asn Glu Glu Arg Leu Gln Val Val Lys Leu Leu
            285             290             295

gca aaa atg ttt ggg gca aag gat tca gaa ttg gct tct caa aac aag   1085
Ala Lys Met Phe Gly Ala Lys Asp Ser Glu Leu Ala Ser Gln Asn Lys
            300             305             310

cca ctt tgg cag tgc tac ttg ggc agg ttt aat gat atc cat gta cca   1133
Pro Leu Trp Gln Cys Tyr Leu Gly Arg Phe Asn Asp Ile His Val Pro
            315             320             325

atc cgc ctg gaa tgt gtg aaa ttt gct agc cat tgt ctc atg aac cat   1181
Ile Arg Leu Glu Cys Val Lys Phe Ala Ser His Cys Leu Met Asn His
            330             335             340

cct gat tta gca aaa gac tta aca gag tat ctt aaa gtg agg tca cat   1229
Pro Asp Leu Ala Lys Asp Leu Thr Glu Tyr Leu Lys Val Arg Ser His
345             350             355             360

gac cct gag gaa gct att aga cat gat gtt att gtg tca ata gtt aca   1277
Asp Pro Glu Glu Ala Ile Arg His Asp Val Ile Val Ser Ile Val Thr
            365             370             375

gct gct aaa aag gat att ctt ctg gtc aat gat cac tta ctt aat ttt   1325
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18

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Ala Ala Lys Lys Asp Ile Leu Leu Val Asn Asp His Leu Leu Asn Phe
        380                 385                 390

gtg aga gag aga aca tta gac aaa cga tgg aga gta cgc aaa gaa gcc    1373
Val Arg Glu Arg Thr Leu Asp Lys Arg Trp Arg Val Arg Lys Glu Ala
        395                 400                 405

atg atg gga ctt gcc caa att tat aag aaa tat gct tta cag tca gca    1421
Met Met Gly Leu Ala Gln Ile Tyr Lys Lys Tyr Ala Leu Gln Ser Ala
        410                 415                 420

gct gga aaa gat gct gca aaa cag ata gca tgg atc aaa gac aaa ttg    1469
Ala Gly Lys Asp Ala Ala Lys Gln Ile Ala Trp Ile Lys Asp Lys Leu
425                 430                 435                 440

cta cat ata tat tat caa aat agt att gat gat cga cta ctt gtt gaa    1517
Leu His Ile Tyr Tyr Gln Asn Ser Ile Asp Asp Arg Leu Leu Val Glu
                445                 450                 455

cgg atc ttt gct caa tac atg gtt cct cac aat tta gaa act aca gaa    1565
Arg Ile Phe Ala Gln Tyr Met Val Pro His Asn Leu Glu Thr Thr Glu
                460                 465                 470

cgg atg aaa tgc tta tat tac ttg tat gcc aca ctg gat tta aat gct    1613
Arg Met Lys Cys Leu Tyr Tyr Leu Tyr Ala Thr Leu Asp Leu Asn Ala
        475                 480                 485

gtg aaa gca ttg aat gaa atg tgg aaa tgt caa aat ctg ctc cga cat    1661
Val Lys Ala Leu Asn Glu Met Trp Lys Cys Gln Asn Leu Leu Arg His
        490                 495                 500

caa gta aag gat ttg ctt gac ttg att aag caa ccc aaa aca gat gcc    1709
Gln Val Lys Asp Leu Leu Asp Leu Ile Lys Gln Pro Lys Thr Asp Ala
505                 510                 515                 520

agt gtc aag gcc ata ttt tca aaa gtg atg gtt att aca aga aat tta    1757
Ser Val Lys Ala Ile Phe Ser Lys Val Met Val Ile Thr Arg Asn Leu
                525                 530                 535

cct gat cct ggt aag gct cag gat ttc atg aag aaa ttc aca cag gtg    1805
Pro Asp Pro Gly Lys Ala Gln Asp Phe Met Lys Lys Phe Thr Gln Val
                540                 545                 550

tta gaa gat gat gag aaa ata aga aag cag tta gaa gta ctt gtt agt    1853
Leu Glu Asp Asp Glu Lys Ile Arg Lys Gln Leu Glu Val Leu Val Ser
        555                 560                 565

cca aca tgc tcc tgc aag cag gct gaa ggt tgt gtg cgt gaa ata act    1901
Pro Thr Cys Ser Cys Lys Gln Ala Glu Gly Cys Val Arg Glu Ile Thr
        570                 575                 580

aag aag ttg ggc aac ccc aaa cag cct aca aat cct ttc ctg gaa atg    1949
Lys Lys Leu Gly Asn Pro Lys Gln Pro Thr Asn Pro Phe Leu Glu Met
585                 590                 595                 600

atc aag ttt ctc ttg gag agg ata gca cct gtg cac ata gat acc gaa    1997
Ile Lys Phe Leu Leu Glu Arg Ile Ala Pro Val His Ile Asp Thr Glu
                605                 610                 615

tct atc agt gct ctt att aaa caa gtg aac aaa tca ata gat gga aca    2045
Ser Ile Ser Ala Leu Ile Lys Gln Val Asn Lys Ser Ile Asp Gly Thr
                620                 625                 630

gca gat gat gaa gat gag ggt gtt cca act gat caa gcc atc aga gca    2093
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Ala Asp Asp Glu Asp Glu Gly Val Pro Thr Asp Gln Ala Ile Arg Ala
        635             640             645

ggt ctt gaa ctg ctt aag gta ctc tca ttt aca cat ccc atc tca ttt    2141
Gly Leu Glu Leu Leu Lys Val Leu Ser Phe Thr His Pro Ile Ser Phe
        650             655             660

cat tct gct gaa aca ttt gaa tca tta ctg gct tgt ctg aaa atg gat    2189
His Ser Ala Glu Thr Phe Glu Ser Leu Leu Ala Cys Leu Lys Met Asp
665             670             675             680

gat gaa aaa gta gca gaa gct gca cta caa att ttc aaa aac aca gga    2237
Asp Glu Lys Val Ala Glu Ala Ala Leu Gln Ile Phe Lys Asn Thr Gly
            685             690             695

agc aaa att gaa gag gat ttt cca cac atc aga tca gcc ttg ctt cct    2285
Ser Lys Ile Glu Glu Asp Phe Pro His Ile Arg Ser Ala Leu Leu Pro
            700             705             710

gtt tta cat cac aaa tct aaa aaa gga ccc ccc cgt caa gcc aaa tat    2333
Val Leu His His Lys Ser Lys Lys Gly Pro Pro Arg Gln Ala Lys Tyr
        715             720             725

gcc att cat tgt atc cat gcg ata ttt tct agt aaa gag acc cag ttt    2381
Ala Ile His Cys Ile His Ala Ile Phe Ser Ser Lys Glu Thr Gln Phe
        730             735             740

gca cag ata ttt gag cct ctg cat aag agc cta gat cca agc aac ctg    2429
Ala Gln Ile Phe Glu Pro Leu His Lys Ser Leu Asp Pro Ser Asn Leu
745             750             755             760

gaa cat ctc ata aca cca ttg gtt act att ggt cat att gct ctc ctt    2477
Glu His Leu Ile Thr Pro Leu Val Thr Ile Gly His Ile Ala Leu Leu
            765             770             775

gca cct gat caa ttt gct gct cct tgg aaa tct tgg gta gct act ttc    2525
Ala Pro Asp Gln Phe Ala Ala Pro Trp Lys Ser Trp Val Ala Thr Phe
            780             785             790

att gtg aaa gat ctt ctc atg aat gat cgg ctt cca ggg aaa aag aca    2573
Ile Val Lys Asp Leu Leu Met Asn Asp Arg Leu Pro Gly Lys Lys Thr
            795             800             805

act aaa ctt tgg gtt cca gat gaa gaa gta tct cct gag aca atg gtc    2621
Thr Lys Leu Trp Val Pro Asp Glu Glu Val Ser Pro Glu Thr Met Val
        810             815             820

aaa att cag gct att aaa atg atg gtt cga tgg cta ctt gga atg aaa    2669
Lys Ile Gln Ala Ile Lys Met Met Val Arg Trp Leu Leu Gly Met Lys
825             830             835             840

aat aat cac agt aaa tca gga act tct acc tta aga ttg cta aca aca    2717
Asn Asn His Ser Lys Ser Gly Thr Ser Thr Leu Arg Leu Leu Thr Thr
            845             850             855

ata ttg cat agt gat gga gac ttg aca gaa cag ggg aaa att agt aaa    2765
Ile Leu His Ser Asp Gly Asp Leu Thr Glu Gln Gly Lys Ile Ser Lys
            860             865             870

cca gat atg tca cgt ctg aga ctt gct gct ggg agt gct att gtg aag    2813
Pro Asp Met Ser Arg Leu Arg Leu Ala Ala Gly Ser Ala Ile Val Lys
        875             880             885

ctg gca caa gaa ccc tgt tac cat gaa atc atc aca tta gaa caa tat    2861
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20

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Leu Ala Gln Glu Pro Cys Tyr His Glu Ile Ile Thr Leu Glu Gln Tyr
    890               895               900

cag cta tgt gca tta gct atc aac gat gaa tgc tat caa gta aga caa   2909
Gln Leu Cys Ala Leu Ala Ile Asn Asp Glu Cys Tyr Gln Val Arg Gln
905               910               915               920

gtg ttt gcc cag aaa ctt cac aaa ggc ctt tcc cgt tta cgg ctt cca   2957
Val Phe Ala Gln Lys Leu His Lys Gly Leu Ser Arg Leu Arg Leu Pro
                  925               930               935

ctt gag tat atg gca atc tgt gcc ctt tgt gca aaa gat cct gta aag   3005
Leu Glu Tyr Met Ala Ile Cys Ala Leu Cys Ala Lys Asp Pro Val Lys
              940               945               950

gag aga aga gct cat gct agg caa tgt ttg gtg aaa aat ata aat gta   3053
Glu Arg Arg Ala His Ala Arg Gln Cys Leu Val Lys Asn Ile Asn Val
          955               960               965

agg cgg gag tat ctg aag cag cat gca gct gtt agt gaa aaa tta ttg   3101
Arg Arg Glu Tyr Leu Lys Gln His Ala Ala Val Ser Glu Lys Leu Leu
      970               975               980

tct ctt cta cca gag tat gtt gtt cca tat aca att cac ctt ttg gca   3149
Ser Leu Leu Pro Glu Tyr Val Val Pro Tyr Thr Ile His Leu Leu Ala
985               990               995               1000

cat gac cca gat tat gtc aaa gta cag gat att gaa caa ctt aaa gat   3197
His Asp Pro Asp Tyr Val Lys Val Gln Asp Ile Glu Gln Leu Lys Asp
              1005              1010              1015

gtt aaa gaa tgt ctt tgg ttt gtt ctg gaa ata tta atg gct aaa aat   3245
Val Lys Glu Cys Leu Trp Phe Val Leu Glu Ile Leu Met Ala Lys Asn
          1020              1025              1030

gaa aat aac agt cac gct ttt atc aga aag atg gta gaa aat att aaa   3293
Glu Asn Asn Ser His Ala Phe Ile Arg Lys Met Val Glu Asn Ile Lys
      1035              1040              1045

caa aca aaa gat gcc caa gga cca gat gat gca aaa atg aat gaa aaa   3341
Gln Thr Lys Asp Ala Gln Gly Pro Asp Asp Ala Lys Met Asn Glu Lys
   1050              1055              1060

ctg tac act gtg tgt gat gtt gcc atg aat atc atc atg tca aag agt   3389
Leu Tyr Thr Val Cys Asp Val Ala Met Asn Ile Ile Met Ser Lys Ser
1065              1070              1075              1080

act aca tac agt ttg gaa tct cct aaa gac ccg gta cta cca gct cgt   3437
Thr Thr Tyr Ser Leu Glu Ser Pro Lys Asp Pro Val Leu Pro Ala Arg
              1085              1090              1095

ttc ttc act caa cct gac aag aat ttc agt aac acc aaa aat tat ctg   3485
Phe Phe Thr Gln Pro Asp Lys Asn Phe Ser Asn Thr Lys Asn Tyr Leu
              1100              1105              1110

cct cct gaa atg aaa tca ttt ttc act cct gga aaa cct aaa aca acc   3533
Pro Pro Glu Met Lys Ser Phe Phe Thr Pro Gly Lys Pro Lys Thr Thr
          1115              1120              1125

aat gtt cta gga gct gtt aac aag cca ctt tca tca gca ggc aag caa   3581
Asn Val Leu Gly Ala Val Asn Lys Pro Leu Ser Ser Ala Gly Lys Gln
      1130              1135              1140

tct cag acc aaa tca tca cga atg gaa act gta agc aat gca agc agc   3629
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21

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                    Ser Gln Thr Lys Ser Ser Arg Met Glu Thr Val Ser Asn Ala Ser Ser
                    1145             1150             1155             1160


                    agc tca aat cca agc tct cct gga aga ata aag ggg agg ctt gat agt    3677
                    Ser Ser Asn Pro Ser Ser Pro Gly Arg Ile Lys Gly Arg Leu Asp Ser
                                      1165             1170             1175


                    tct gaa atg gat cac agt gaa aat gaa gat tac aca atg tct tca cct    3725
                    Ser Glu Met Asp His Ser Glu Asn Glu Asp Tyr Thr Met Ser Ser Pro
                             1180             1185             1190


                    ttg ccg ggg aaa aaa agt gac aag aga gac gac tct gat ctt gta agg    3773
                    Leu Pro Gly Lys Lys Ser Asp Lys Arg Asp Asp Ser Asp Leu Val Arg
                             1195             1200             1205


                    tct gaa ttg gag aag cct aga ggc agg aaa aaa acg ccc gtc aca gaa    3821
                    Ser Glu Leu Glu Lys Pro Arg Gly Arg Lys Lys Thr Pro Val Thr Glu
                        1210             1215             1220


                    cag gag gag aaa tta ggt atg gat gac ttg act aag ttg gta cag gaa    3869
                    Gln Glu Glu Lys Leu Gly Met Asp Asp Leu Thr Lys Leu Val Gln Glu
                    1225             1230             1235             1240


                    cag aaa cct aaa ggc agt cag cga agt cgg aaa aga ggc cat acg gct    3917
                    Gln Lys Pro Lys Gly Ser Gln Arg Ser Arg Lys Arg Gly His Thr Ala
                                      1245             1250             1255


                    tca gaa tct gat gaa cag cag tgg cct gag gaa aag agg ctc aaa gaa    3965
                    Ser Glu Ser Asp Glu Gln Gln Trp Pro Glu Glu Lys Arg Leu Lys Glu
                             1260             1265             1270


                    gat ata tta gaa aat gaa gat gaa cag aat agt ccg cca aaa aag ggt    4013
                    Asp Ile Leu Glu Asn Glu Asp Glu Gln Asn Ser Pro Pro Lys Lys Gly
                             1275             1280             1285


                    aaa aga ggc cga cca cca aaa cct ctt ggt gga ggt aca cca aaa gaa    4061
                    Lys Arg Gly Arg Pro Pro Lys Pro Leu Gly Gly Gly Thr Pro Lys Glu
                        1290             1295             1300


                    gag cca aca atg aaa act tct aaa aaa gga agc aaa aaa aaa tct gga    4109
                    Glu Pro Thr Met Lys Thr Ser Lys Lys Gly Ser Lys Lys Lys Ser Gly
                    1305             1310             1315             1320


                    cct cca gca cca gag gag gag gaa gaa gaa gaa aga caa agt gga aat    4157
                    Pro Pro Ala Pro Glu Glu Glu Glu Glu Glu Glu Arg Gln Ser Gly Asn
                                      1325             1330             1335


                    acg gaa cag aag tcc aaa agc aaa cag cac cga gtg tca agg aga gca    4205
                    Thr Glu Gln Lys Ser Lys Ser Lys Gln His Arg Val Ser Arg Arg Ala
                                  1340             1345             1350


                    cag cag aga gca gaa tct cct gaa tct agt gca att gaa tcc aca cag    4253
                    Gln Gln Arg Ala Glu Ser Pro Glu Ser Ser Ala Ile Glu Ser Thr Gln
                         1355             1360             1365


                    tcc aca cca cag aaa gga cga gga aga cca tca aaa acg cca tca cca    4301
                    Ser Thr Pro Gln Lys Gly Arg Gly Arg Pro Ser Lys Thr Pro Ser Pro
                        1370             1375             1380


                    tca caa cca aaa aaa aat gtg taagttgtaa atattacatt tcaaaccaat    4352
                    Ser Gln Pro Lys Lys Asn Val
                    1385             1390


                    ttcaaattat tttgcaaaag ttcctaaatt tgtaaacata catattgctg tatttaaatt 4412
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22

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